

*Sensitive Rare Plant Areas with Woody Invasives (30.8 acres)*

In order to protect the integrity of rare plant populations near woody invasives, we will follow the NHESP guidelines outlined in the RFR (page 3 under conditions/amendments). These guidelines are as follows:

- If a rare plant is within 10 m of any work, the plant should be flagged or a botanist present when the work is performed.
- Any invasive control work done within 2 m of rare plants must be done by a drip bottle or glove. In instances where there are few rare plants and many invasive plants, the MESA plants can be covered with buckets during the use of sprayers to allow for more efficient application.
- Rare plants within 10 m of all invasive control work should be monitored within two weeks after any herbicide application to check for herbicide damage. Any damage should be reported to the NHESP and DCR in writing within 7 days of the observation.
- Anything outside of 10 m of a rare plant occurrence has no restrictions for treatment.
- Foliar sprays can also be used during dormant windows for rare plants (e.g., at Greylock Glen Japanese Barberry leaves out early in the spring before nearby rare plants are active).

Specific methods and timing are as follows:

1. Foliar spray small invasive shrubs and ground level bittersweet (Summers 2013 and 2014).
2. Cut stem/stump herbicide application to large invasive shrubs/trees and bittersweet growing vertically into trees AND to those invasives within 2 meters of rare plants (Summer 2013).
3. Follow-up foliar spot spray (Summer 2014).

*Transition Zone*

Within the transition zone between the upland and wetland we will only use herbicides listed on the Sensitive Area Materials List (Appendix D) in accordance with the Sensitive Area Restrictions (Appendix C). We have listed the herbicides selected for the project as a subset of the Sensitive Area Materials List in Appendix A. Only low-pressure foliar treatments, basal bark, and cut stem treatments will be used in the Transition Zone. For more information about these methods see Appendix B.

*Wetlands Zone*

Wetland areas require an extremely targeted approach that minimizes herbicide use but is also very effective. We will use the cut stem/stump approach within these areas as

described above for upland and non-sensitive areas. The only difference is that we will use the wetland-appropriate herbicide Rodeo<sup>®</sup> (glyphosate - EPA Reg. No. 62719-324) at a concentration of 25% mixed with water. The herbicide will be applied with a PVC Applicator (Figure 11) developed by The Nature Conservancy to avoid drift and non-target damage. Follow-up treatment will consist of a spot foliar spray application to any resurgent woody plants. This mix will consist of Rodeo<sup>®</sup> and wetland surfactant.



**Figure 11.** PVC Applicator.

### *Brush Piles*

Cut brush will be stacked into neat brush piles in *Transition Zones*, Upland Areas or Wetland Zones. Piles will be no larger than 8' tall by 12' wide. Kraft paper will be used to cover the piles prior to snow accumulation in order to keep the piles relatively dry for winter/spring brush burning. The paper covers will also help contain invasive plant seeds.

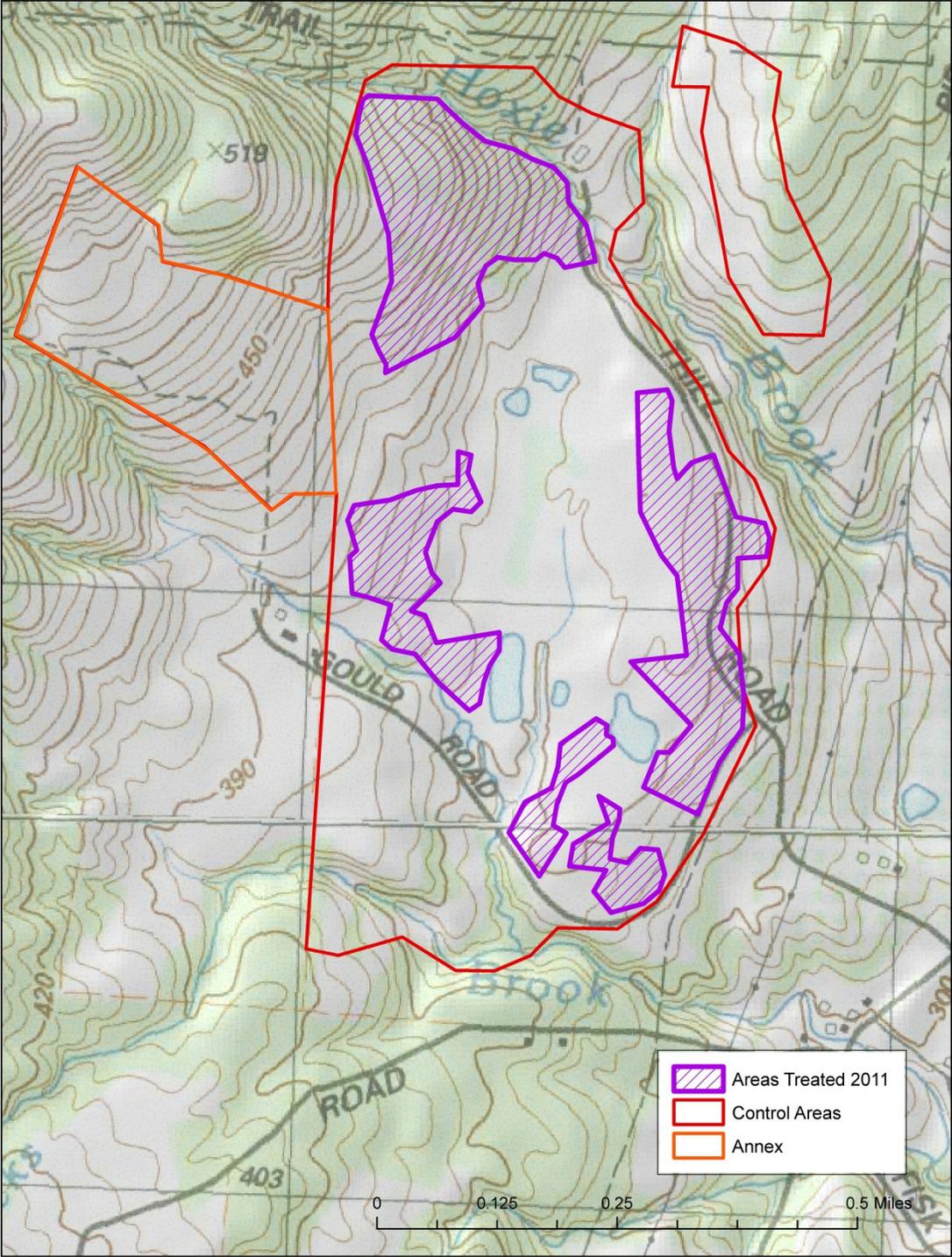
Open burning season begins on January 15<sup>th</sup> and continues until May 1<sup>st</sup>. The Adams Fire Department (Alert Hose Company #1) will be consulted prior to any burning and local permits will be obtained. All Massachusetts Open Burning permits will be obtained and regulations will be followed.

### *Control Work Done to Date*

PES has carried out early stages of control work within portions of Control Area C-1 (Figure 12). In late spring 2010, garlic mustard that had already gone to seed was hand-pulled in upland areas. Bags of garlic mustard were transported back to PES headquarters and burned in March 2011. In early spring of 2011, PES hand-pulled garlic mustard within rare plant sensitive areas, and in the vicinity of trails and roadways. The rest of the garlic mustard was then foliar sprayed using hand-pump backpack sprayers and a 2% solution of Accord<sup>®</sup> concentrate.

The PES crew treated 31-acres of woody invasive plants in 2011 with a foliar spray application using 70-gallons of the three-way mix of Accord Concentrate<sup>®</sup> (glyphosate - EPA Reg. No. 62719-324), Escort XP<sup>®</sup> (metsulfuron methyl - EPA Reg. No. 352-439), Arsenal<sup>®</sup> (imazapyr - EPA Reg. No. 241-346) with a non-ionic surfactant. Dates of work in 2011 were 8/1, 8/17, 8/23, and 8/24.

The PES crew also treated 24.6-acres of Japanese barberry within a sensitive area associated with a rare orchid. The barberry was treated with a foliar spray application. The herbicide used was Accord Concentrate<sup>®</sup> (2%) with non-ionic surfactant. A total of 12 gallons of solution was used. Dates of work in 2011 were 6/29 and 6/30.



**Figure 12.** Areas treated for invasive plants in 2011.

## Monitoring

There are three monitoring components to this project (each component is described in greater detail below):

1. Prior to and/or during herbicide applications, an NHESP-approved botanist must flag rare plant species within areas of control work and/or monitor workers during invasive control work within 10 m of rare plant populations.
2. Within two weeks of herbicide applications, the botanist must revisit areas within 10 m of rare plants to check for herbicide damage.
3. As part of the long-term monitoring, maintenance, and EDRR (Early Detection/Rapid Response) plan being developed for the Greylock Glen property, the botanist must also monitor the efficacy of the invasive control work conducted to provide necessary information for follow-up treatments.

Biodiversity is conducting all three monitoring components of this project.

An NHESP-approved botanist flagged all rare plants and/or monitored invasive control work at all control sites within 10 meters of rare plant populations, both at the time of the control work and within two weeks of herbicide applications to check rare species for herbicide damage.

To verify that control efforts have not impacted rare species, the botanist counted all three birds orchid (*Triphora trianthophora*) stems near treated barberry approximately three weeks after herbicide spraying, once the three birds orchid stems were large enough for easy detection. We mapped 17 locations where three birds orchid stems were within 10 meters of treated barberry. No damaged three birds orchids were observed. Prior to wetland invasive control work, the botanist collected baseline data on stem counts of Bailey's sedge (*Carex baileyi*) at four locations where this rare species and invasives were in close proximity.

To monitor the efficacy of the invasive control work, Biodiversity established 60 pretreatment monitoring plots in 26 locations with mapped invasives (2-3 plots per location) throughout the four control areas. In areas with dense invasive growth, 2x2 meter plots were established, while 5x5 meter plots were created in areas with sparser invasive growth. Prior to control work, we collected baseline data during the spring of 2011 on the level of invasion at each monitoring location. In each plot, the number of stems (or estimates in high-density areas) of each invasive species was recorded. Similar surveys will be conducted one and two years after control work to detect changes in invasive plant densities.